



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

RECEIVED
AUG 22 2002
TECHNOLOGY CENTER 2800

Applicant : Reitz et al.
Applic No.: 09/266,202
Filed : October 4, 2000
For : ZINC OXIDE PARTICLES
Docket No.: 2950.08-US-02

Appeal No.
Group Art Unit: 2832
Examiner: K.S.Lee

BRIEF FOR APPELLANT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Applicant : REITZ et al.

Appeal No.

Applic No.: 09/266,202

Group Art Unit: 2832

Filed : March 10, 1999

Examiner: K.S. Lee

For : ZINC OXIDE PARTICLES

Docket No.: 2950.08-US-02

BRIEF FOR APPELLANT

BOX AF
Assistant Commissioner For Patents
Washington, D.C. 20231

Sir:

This is an appeal from an Office Action dated January 16, 2002, in which claims 1-5, 7-9, and 25-30 were finally rejected. A Notice of Appeal was filed on April 16, 2002. A Petition for Extension of Time for a two month extension is filed herewith. Applicants believe that no additional extensions of time are needed. If additional extensions of time are needed, consider this paper as a petition for such an extension.

REAL PARTY IN INTEREST

NeoPhotonics Corporation, a corporation organized under the laws of the state of Delaware, and having offices at 49040 Milmont Drive, Fremont, California, has acquired the entire right, title and interest in and to the invention, the application, and any and all patents to be obtained therefor, as per the Assignment of the present case, recorded on Reel 010198, frame 0778. Note that NeoPhotonics Corporation is the same entity that was called NanoGram Corporation and has retained the name NanoGram Corporation for use in connection with its wholly owned subsidiary following a formal name change.

RELATED APPEALS AND INTERFERENCES

The parent application of the present case has been appealed to the USPTO for issues similar to the present case (Appeal No. 12242).

STATUS OF THE CLAIMS

Claims 1-5, 7-9, and 25-30 stand rejected. The pending claims are listed in Appendix A.

STATUS OF AMENDMENTS

All Amendments have been entered.

SUMMARY OF INVENTION

Applicants' invention relates to zinc oxide particles, which can be used for making display devices and other devices incorporating highly uniform particles. The particles emit light in response to stimulation, such as electrical stimulation. The zinc oxide particles are suitable, among other things, for the incorporation into display devices wherein the particles are selectively excited to produce an image. A variety of display devices and corresponding structures are described in Applicants' specification, e.g., at page 36, line 19 to page 38, line 8.

The use of highly uniform particles provides for greater control over the emissions of the particles. See page 34, line 3 to line 33. Specifically, particles with a narrow particle size distribution have a corresponding light emission band covering a narrow frequency range. See page 35, lines 9-17 and page 5, line 33 to page 6, line 6. The production of highly uniform nanoparticles is enabled, for example, by the laser pyrolysis approach described in Applicants' specification.

Laser pyrolysis for particle generation involves a reactant stream that flows through an intense light beam, such as a laser beam. See, for example, page 6, lines 32-33. The light beam drives the chemical reaction. See, for example, page 6, line 33 to page 7, line 4. Because of the intense temperatures generated by absorption of light by compounds flowing through the light beam, the light beam forms a well defined reaction zone. See page 8, lines 14-35. Controlling the laser intensity, chamber pressure, and reactant flow rate results in the extreme uniformity of the resulting particles. See, for example, page 8, lines 14 - page 9 line 4.

The resulting particles produced by, among other methods, laser pyrolysis can have a very narrow particle size distribution. In particular, the particles have a narrow distribution about the average particle size, as determined by transmission electron microscopy. See, for example, Figures 16 and 17 of the application.

These highly uniform particles are particularly well suited for the formation of improved display devices. See, for example, page 4, lines 29-32. In addition, the uniformity of the particles leads to processing advantages with respect to the formation of thin layers with sharp edges. See page 35, lines 18-27.

ISSUES

1. Whether claims 1-5, 25 and 26 are obvious over U.S. Patent 5,455,489 to Bhargava (the Bhargava patent) in view of U.S. Patent 5,442,254 to Jaskie (the Jaskie patent)?
2. Whether claims 1, 7-9, and 27-30 are obvious over U.S. Patent No. 5,770,113 to Iga et al. (the Iga patent) in view of the Jaskie patent?

GROUPING OF CLAIMS

Claims 1-5, 7-9, and 25-30 are within a single claim group.

ARGUMENT

I. LEGAL BACKGROUND

A. The Examiner bears the burden of demonstrating nonobviousness.

The Applicants note that the patent office has the burden of persuasion in showing that the Applicants are not entitled to a patent. "[T]he conclusion of obviousness *vel non* is based on the preponderance of evidence and argument in the record." *In re Oetiker*, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992). The patent office has the ultimate burden of persuasion in establishing that an applicant is not entitled to a patent. *Id.* at 1447, concurring opinion of Judge Plager. "**The only determinative issue is whether the record as a whole supports the legal conclusion that the invention would have been obvious.**" *Id.*

"In rejecting claims under 35 U.S.C. §103, the examiner bears the initial burden of presenting a *prima facie* case of obviousness. *In re Rijckaert*, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993). *Prima facie* obviousness is not established if all the elements of the rejected claim are not disclosed or suggested in the cited art. *In re Ochiai*, 37 USPQ 1127, 1131 (Fed. Cir. 1995). ("The test for obviousness *vel non* is statutory. It requires that one compare the claim's 'subject matter as a whole' with the prior art 'to which said subject matter pertains.'"). See also, MPEP 2143.03 "All Claim Limitations Must Be Taught or Suggested," citing *In re Royka*, 180 USPQ 580 (CCPA 1974).

If the Examiner fails to establish a *prima facie* case of obviousness, the obviousness rejection must be withdrawn as a matter of law. *In re Ochiai*, 37 USPQ at 1131 ("When the references cited by the examiner fail to establish a *prima facie* case of obviousness, the rejection is improper and will be overturned.") In addition, as described in the next section, *prima facie* obviousness is not established if the cited art does not enable the production of a claimed

composition or apparatus.

Even if the Examiner meets his burden of establishing a prima facie case of obviousness, Applicants can rebut this prima facie case by presenting objective evidence. *In re Rijckaert*, 28 USPQ2d at 1956 ("Only if that burden is met, does the burden of coming forward with evidence or argument shift to the applicant.") As discussed below, failure of the Examiner to consider objective evidence, let alone adequately rebut it, is grounds for withdrawal of the rejection.

B. To support a finding of obviousness based on cited art, the cited art must provide a means of obtaining the claimed composition or apparatus.

The proposition is well established that the cited art only renders a composition of matter or apparatus unpatentable to the extent that the cited art enables the disputed claims, in other words, if the cited art provides a means of obtaining the claimed composition or apparatus.

To the extent that anyone may draw an inference from the Von Bramer case that the mere printed conception or the mere printed contemplation which constitutes the designation of a 'compound' is sufficient to show that such a compound is old, regardless of whether the compound is involved in a 35 U.S.C. 102 or 35 U.S.C. 103 rejection, we totally disagree. ... We think, rather, that the true test of any prior art relied upon to show or suggest that a chemical compound is old, is whether the prior art is such as to place the disclosed 'compound' in the possession of the public. *In re Brown*, 141 USPQ 245, 248-49 (CCPA 1964)(emphasis in original)(citations omitted).

Similarly, see *In re Hoeksema*, 158 USPQ 596, 600 (CCPA 1968)(emphasis in original):

We are certain, however, that the invention as a whole is the claimed compound and a way to produce it, wherefore appellant's argument has substance. There has been no showing by the Patent Office in this record that the claimed compound can exist because there is no showing of a known or obvious way to manufacture it; hence, it seems to us that the 'invention as a whole,' which section 103 demands that we consider, is not obvious from the prior art of record.

While there are valid reasons based on public policy as to why this defect in the prior art precludes a finding of obviousness under section 103,

In re Brown, *supra*, its immediate significance in the present inquiry is that it poses yet another difference between the claimed invention and the prior art which must be considered in the context of section 103. So considered, we think the differences between appellant's invention as a whole and the prior art are such that the claimed invention would not be obvious within the contemplation of 35 U.S.C. 103.

The Court of Appeals for the Federal Circuit has exclusive appellate jurisdiction for cases arising under the patent law under 28 U.S.C. § 1295 (a)(1). The Federal Circuit has adopted as binding precedent all holding of its predecessor courts, the U.S. Court of Claims and the U.S. Court of Customs and Patent Appeals. South Corp. v. U.S., 215 USPQ 657 (Fed.Cir. 1982). Therefore, these CCPA cases are binding precedent for the present appeal.

The Federal Circuit has further emphasized these issues. "But to be prior art under section 102(b), a reference must be enabling. That is, it must put the claimed invention in the hands of one skilled in the art." In re Sun, 31 USPQ2d 1451, 1453 (Fed. Cir. 1993)(unpublished). Assertions in a prior art reference do not support an anticipation or obviousness rejection unless the references place the claimed invention in the hands of the public. Beckman Instruments Inc. v. LKB Produkter AB, 13 USPQ2d 1301, 1304 (Fed. Cir. 1989). "In order to render a claimed apparatus or method obvious, the prior art must enable one skilled in the art to make and use the apparatus or method." *Id.* While a properly citable reference is prior art for all that it teaches, references along with the knowledge of a person of ordinary skill in the art must be enabling to place the invention in the hands of the public. In re Paulsen, 31 USPQ2d 1671, 1675 (Fed. Cir. 1994). See also In re Donohue, 226 USPQ 619, 621 (Fed. Cir. 1985).

It follows from this discussion that assertions of unpatentability without an appropriate disclosure in the cited art of how to make a claimed composition or article does not establish prima facie unpatentability based on that cited art.

C. Objective evidence must be considered as part of a factual inquiry in an obviousness analysis.

In evaluating obviousness, the level of skill in the art must be considered. MPEP §2141,

citing Graham v. John Deere, 383 U.S. 1, 148 USPQ 459 (1966). In the present case, a person of ordinary skill in the art would have, at least, a bachelors degree in electrical engineering, material science or physics, and with experience in particle technology and/or the fluorescent properties of material.

Under a factual inquiry relating to an obviousness analysis, objective evidence **must** be considered. See, MPEP §2141, and Graham v. John Deere, 383 U.S. 1, 148 USPQ 459 (1966). As stated in MPEP 716.01(c), "[opinion] testimony is entitled to consideration and some weight so long as the opinion is not on the ultimate legal conclusion." Moreover, "In assessing the probative value of an expert opinion, the examiner **must** consider the nature of the matter sought to be established, the strength of any opposing evidence, the interest of the expert in the outcome of the case, and the presence and absence of factual support for the expert's opinion." *Id.* (Emphasis added). These statements in the MPEP are consistent with the statements of the Supreme Court in Graham v. John Deere.

Failure to consider objective evidence, let alone adequately rebut it, is grounds for withdrawal of the rejection. Graham v. John Deere, 383 U.S. 1, 148 USPQ 459 (1966).

II. REJECTIONS UNDER 35 U.S.C. §103(a) OVER BHARGAVA AND JASKIE.

A. A prima facie case of obviousness has not been made.

The Examiner rejected claims 1-5, 25, and 26 under 35 U.S.C. §103(a) as being unpatentable over the Bhargava patent and the Jaskie patent. A copy of the Bhargava patent is provided in Appendix B, and a copy of the Jaskie patent is found in Appendix C. The Examiner cited the Bhargava patent for disclosing ZnO, ZnS and Y₂O₃ as phosphor particles but as not disclosing the claimed particle sizes. Office Action of 1/16/2002 at page 2. The Examiner cited the Jaskie patent for disclosing display devices with phosphor particles having an average diameter of less than 100 nm wherein the particle size is selected as desired. Office Action of 1/16/2002 at

page 2.

The Examiner has failed to establish a *prima facie* case of obviousness with respect to this rejection, both because all of the elements of the rejected claims are neither disclosed nor suggested by the cited art, and because cited art does not enable the production of a claimed composition or apparatus.

With respect to the failure to disclose or suggest all of the elements of the rejected claims, the Examiner has admitted that the Bhargava patent does not disclose the claimed particle size distribution. Office Action of 1/16/2002 at page 2. Nothing in the Jaskie patent or any cited art of record cures this clear deficiency of the Bhargava patent.

With respect to the Jaskie patent, the Examiner further cited the Jaskie patent as teaching that the specification of a desired particle range is within the skill of the art. Office Action of 1/16/2002 at page 2. The Examiner further argued that it would therefore have been obvious to specify a desired particle range since the specification of a desired particle range was within the skill of the art. Office Action of 1/16/2002 at page 2. However, Applicants respectfully submit that the Examiner fails to establish a *prima facie* case showing that the Jaskie patent enables the production of zinc oxide particles with the claimed particle size distribution. The Jaskie patent presents a theoretical description of how quantum confined phosphors with a selected particle size would have a particular emission wavelength. See the Jaskie patent throughout. Then, the patent provides a vague prophetic description about obtaining arbitrarily desired particles using a wet-filtration technique. The Jaskie patent at column 7, lines 28-40. Applicants respectfully submit that this vague description falls short of *prima facie* establishing the enablement of formation of particles with a narrow particle size distribution, as claimed.

With respect to other cited art of record, in the Advisory Action of August 6, 2002, the Examiner cites U.S. Patent 5,460,701 to Parker et al. (the Parker patent, Appendix E) for support for the filtering of nanoparticles. Applicants submit that this conclusion is based on a serious

misunderstanding of the Parker patent, as described further below.

The Parker patent at column 4, line 54 *et seq.* is describing a collector that removes "weakly agglomerated nanocrystals" from a flow. The filter in the Parker patent does not and is not described as separating nanoparticles from each other based on size. Furthermore, the agglomerated nanocrystals (not nanoparticles) may not have a submicron average particle size. Since the Parker patent does not describe separating nanoparticles based on size to obtain a narrow particle size distribution, the Parker patent is irrelevant to the present discussion.

Since the Jaskie patent is deficient on its face and since the Parker patent is irrelevant, the Examiner has failed to establish a means in the cited references for producing the claimed narrow particle size distribution for the zinc oxide particles of the claims. Therefore, the Examiner has failed to establish *prima facie* obviousness of the claimed zinc oxide particles because a method of making the claimed materials has not been established in the cited references. Due to the shortcomings of the cited references, the Examiner has fallen short of meeting the burden of establishing *prima facie* obviousness.

Assuming arguendo that *prima facie* obviousness has been established, Applicants respectfully submit that the obviousness rejection should be withdrawn because the Examiner failed to consider, let alone rebut, the objective evidence presented by Applicants, and because Applicants have rebutted this *prima facie* obviousness via the presentation of unrefuted objective evidence.

The obviousness rejection should be withdrawn until such time as the Examiner has considered and rebutted, the evidence presented in the Declarations. The Examiner improperly ignored the Declaration evidence provided by the Applicants. Applicants submitted Declarations by Professor Rajiv Singh and Professor Terry Bricker. The Declarations were submitted in the August 17, 2001 Amendment. Neither the Examiner's Final Office Action of January 16, 2002 nor the Advisory Action of August 6, 2002 addressed the Declaration.

Moreover, Applicants have rebutted this *prima facie* obviousness via the presentation of unrefuted objective evidence. As discussed above, Applicants submitted Declarations by Professor Rajiv Singh and Professor Terry Bricker with the Amendment of August 17, 2001. These Declarations make it clear that the disclosure in the Jaskie patent does not provide a reasonable expectation of success with respect to forming, and therefore does not enable production of, zinc oxide as claimed by Applicants.

As discussed further below, Professor Singh's Declaration, see Appendix F, shows that the Jaskie patent did not enable the production of Applicants' claimed invention.

The Applicants also presented further arguments for patentability and objective evidence including a Declaration by Professor Bricker, see Appendix G, that supports positions set forth in Dr. Singh's Declaration, and provides additional objective evidence regarding patentability over the Jaskie reference. The Examiner, however, ignored the Declarations evidence and maintained the obviousness rejection without rebutting the Declarations.

B. Declarations by Professors Bricker and Singh

(1) Declaration by Professor Bricker

A Declaration by Professor Bricker under 37 C.F.R. §1.132 is enclosed with this Appeal Brief in Appendix G. Applicants originally submitted this Declaration with an Amendment dated August 17, 2001.

The Jaskie patent includes a description of a "wet filtering technique" at column 7, lines 28-40. This technique purports to describe how to separate small particles according to their size so that particles of a specified size can be produced. This wet filtration involves the formation of a suspension of the particles and the use of a cloth put into the suspension to draw up the particles.

Professor Bricker's Declaration is specifically directed to significant deficiencies of the wet filtration approach described in the Jaskie patent. Professor Bricker's Declaration also describes

why other chromatographic techniques, including well established methods, would not be expected to accomplish the extremely fine separation needed to obtain the claimed invention.

Professor Bricker is an expert in separation technologies similar to the "wet filtration" approaches described in the Jaskie patent at column 7, lines 28-40. These separation techniques were developed for the separation of chemical species. In addition, these techniques have been generalized for the separation of biological macromolecules, which have a nanometer size scale. Dr. Bricker's Declaration presents an explicit and clear explanation of why the process described in the Jaskie patent cannot and will not work for the intended purpose. Thus, **Applicants have presented clear objective evidence that the Jaskie patent does not enable the production of Applicants' claimed invention.**

Applicants note that Professor Bricker has no interest in the outcome of the present application.

Applicants also note that Professor Bricker has significant extraordinary skill in separation technology relative to a person of ordinary skill in the technology relevant to the claims. A person of ordinary skill in the art of the nanometer scale phosphor particles of the presently claimed invention would be a person with skill in inorganic material science, electrical engineering or physics and generally would have limited understanding of chromatographic separation technology.

(2) Declaration by Professor Singh

Applicants filed a Declaration under 37 C.F.R. §1.132 by Professor Singh by the Amendment of August 17, 2001. A copy of Professor Singh's Declaration is presented in Appendix F.

Dr. Singh's declaration includes an explanation that an undue amount of experimentation would be required to even attempt to practice the wet filtration technique. One reason was that the procedure would be difficult or impossible to scale up.

Moreover, the evidence of record strongly suggests that such a chromatographic separation of nanoparticles based on size would be actually impossible based on the present state of technology. The nature of the matter sought to be established, i.e., size separation of nanoparticles by chromatography, is at best speculative. To establish a new method of purifying nanoparticles based on the minimal guidance from the Jaskie patent is at most an invitation to perform extensive research in the hopes that it may work. The teachings in Jaskie's patent do not provide a reasonable expectation of success and are at most an invitation to experiment in hopes of inventing something that could work. Professor Singh's Declaration addressed the relevant issues from the perspective of an **expert** in the field of inorganic particles regarding the suggestions in the Jaskie patent.

Thus, Applicants have presented additional clear objective evidence that the Jaskie patent does not enable the production of Applicants' claimed invention.

Applicants note that Professor Singh has no interest to be gained in the allowance of the present patent application.

(3) Dr. Singh and Dr. Bricker Declarations considered together.

To confirm that Dr. Singh's expert statements were well founded, Applicants obtained a Declaration from an expert in chromatography, Dr. Bricker, who directly addressed the disclosure in the Jaskie patent and concluded that the Jaskie "wet filtration" will not work to separate nanoparticles. Dr. Bricker's expert Declaration has presented objective evidence to directly address the issues raised in the Jaskie patent. The conclusions that follow from Dr. Bricker's analysis are consistent with and support Dr. Singh's statements. Dr. Bricker was not aware of Dr. Singh's Declaration.

In addition, Applicants present below additional objective evidence that the best conventional filtering approaches available for nanoparticles are not sufficient to perform the necessary particle separation to practice Applicants' claimed invention.

In summary, there is no evidence of record that is contrary to Dr. Singh's statements

regarding the disclosure in the Jaskie patent. The Jaskie patent does not present any experimental results. About seven years after the Jaskie patent issued, there is no public knowledge of successful application of the Jaskie approach. This failure regarding the practice of the Jaskie invention is objective evidence against the Jaskie suggestion. Applicants have further supported the opinions in Dr. Singh's and Dr. Bricker's Declarations by objective evidence, below, regarding the lack of availability of commercial separation approaches suitable to performed the specified particle separations.

Together, the Declarations by Professor Singh and Professor Bricker provide overwhelming objective evidence from a person with considerable experience in the separation of biological nanoparticles as well as the perspective of an expert in inorganic nanoparticle technology that the approach discussed in the Jaskie patent will not work produce the compositions disclosed and claimed by Applicants.

C. The Bhargava and Jaskie Patents

The Jaskie patent fails to enable the making of particles having the size and size distribution that is presently claimed by the Applicants. The Jaskie patent makes vague references to approaches to inorganic nanoparticles separated by size. In particular, the Jaskie patent discusses wet filtration as an approach for separating inorganic nanoparticles. Presumably, the vague Jaskie reference to wet filtration is based on a desire to adapt methods used for biological macromolecules for the separation of inorganic nanoparticles.

It follows from Dr. Bricker's Declaration that the description of wet filtration in the Jaskie patent is not well conceived. In particular, the Jaskie patent provides virtually no guidance in the materials suitable to perform these poorly specified separations. The Jaskie patent specifically refers to the use of cloth. The deficiencies of the Jaskie process are clearly and thoroughly described in Professor Bricker's Declaration.

Applicants have presented objective evidence in the form of Declarations of Dr. Bricker, an expert in separation technology, and Dr. Singh, an expert in inorganic nanoparticle technology, that the "wet filtration" approaches disclosed in the Jaskie patent at column 7, lines 28-40 will not work to obtain particles with a selected narrow particle size. These Declarations provide further evidence that the production of highly uniform nanoparticles, as claimed by Applicants were not within the level of ordinary skill in the art. Specifically, Professor Bricker's Declaration indicates that other forms of chromatography would also not work, and Professor Singh's Declaration indicates that appropriate separation technologies were not known to a person of skill in the inorganic nanoparticle art. These assertions are consistent with the deficiencies in the Jaskie patent since Jaskie is clearly a person of high skill in the art of fluorescent nanoparticle theory. Since Jaskie in the Jaskie patent could not describe how to obtain the desired nanoparticles, presumably a person of ordinary skill in the inorganic nanoparticle art would not have skill required to perform the desired separation.

As further evidence that the particle separation was not within the skill in the art, Applicants present objective data in the form of product information from a commercial supplier of **state of the art** inorganic particle filtration technology. In particular, Applicants have enclosed information in Appendix H downloaded from the Millipore Corporation (Millipore) web site. Millipore is a leader in filtration technology. Uniformity of particles is also a desirable feature for inorganic particles used in the fine polishing of electronic substrates, generally referred to chemical-mechanical polishing or CMP. This information from the Millipore website indicates that in 1999 standard CMP slurries have a significant fraction of larger particles combined with the desired nanoscale particles.

A plot from Millipore of the removal capability of Millipore's line of PlanargardTM filters used to filter surface polishing slurries is included in the enclosed materials. These filters are not perfectly effective for removing particles even with diameters of greater than one micron. In

addition, the filters are not effective for distinguishing a cut-off of particles less than a micron. Applicants' claims indicate that the average particle size is less than 100 nm. Thus, filtration using state of the art commercial filters is not an effective means of creating the narrow particle size distributions, as disclosed and claimed by Applicants.

In contrast with the Jaskie approach of wet filtration, Applicants' particle production approach forms a narrow distribution of particle sizes during the formation of the particles. The average particle size can be adjusted by changing the reaction parameters. Thus, no separation of the particles is needed. Since the Jaskie patent does not place the public in possession of Applicants' claimed invention, the Jaskie patent does not render Applicants' claimed invention obvious. Because of the deficiencies of the Jaskie patent on its face, Applicants believe that the Examiner did not establish prima facie obviousness. To the extent that any aspects of prima facie obviousness have been met, Applicants believe that they have more than met any burden in overcoming prima facie obviousness.

D. Conclusion

The Examiner rejected claims 1-5, 25, and 26 under 35 U.S.C. §103(a) as being unpatentable over the Bhargava patent and the Jaskie patent. The Examiner cited the Bhargava patent for disclosing ZnO, ZnS and Y₂O₃ as phosphors. The Examiner cited the Jaskie patent for teaching size separation of nanoparticles to obtain a narrow particle size distribution.

The Examiner has admitted that the Bhargava patent does not disclose the claimed narrow particle size distribution. As described in detail above, the Jaskie patent does not enable size separation of nanoparticles.

Since the Jaskie patent and the Bhargava patent do not teach appropriate approaches to produce zinc oxide particles with the narrow particle size distribution disclosed and claimed by Applicants, the combined disclosures of the two patents do not render Applicants' claimed

invention *prima facie* obvious. To the extent that the Examiner did establish *prima facie* obviousness, Applicants have presented un-refuted evidence that the cited references do not enable the production of the claimed zinc oxide particles. Thus, Applicants have decidedly refuted any assertions regarding unpatentability over the combined disclosures of the Bhargava patent and the Jaskie patent. Applicants respectfully request the withdrawal of the rejection of claims 1-5, 25, and 26 under 35 U.S.C. §103(a) as being unpatentable over the Jaskie patent in view of the Bhargava patent.

III. REJECTION OVER IGA ET AL. AND JASKIE ET AL.

A. Argument

The Examiner rejected claims 1, 7-9, and 27-30 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent 5,770,113 to Iga et al. (the Iga patent, Appendix D) in view of the Jaskie patent. The Examiner asserts that the Iga patent discloses the claimed invention except for the claimed particle size distribution. The Examiner cited the Jaskie patent for disclosing a particle size distribution within a particular range is within the skill in the art.

However, the Examiner failed to establish a case of *prima facie* obviousness since there is no motivation to combine the references and since the references do not teach all of the claimed elements, in particular the particle size distribution. Applicants respectfully request reconsideration of the rejection based on the following comments.

First, there is no motivation to combine the references since the Iga patent is directed to ceramics formed from sintering zinc oxide along with other oxides to form varistors and the Jaskie patent does not teach or suggest the usefulness of zinc oxides. Indeed, the Iga patent describes the varistors as being used for the surge absorption on an electric circuit (Iga, abstract) whereas the Jaskie patent is directed to a fluorescent device (Jaskie, abstract).

Furthermore, the features of the quantum confined particles of the Jaskie patent are lost if

the particles are sintered into a ceramic material. In particular, once the particles are sintered into a solid (non-particulate material) there are no quantum confined properties since it is a bulk material. Therefore, since the combination of Jaskie and Iga would not be expected to have a successful outcome, there is no motivation to combine them.

Moreover, specification of a particular particle size range (the Jaskie patent) has no value with respect to forming sintered ceramic varistors (the Iga patent). Therefore, the Examiner has failed to establish a *prima facie* showing of motivation to combine the teachings of the Iga patent and the Jaskie patent.

Furthermore, the cited references fail to disclose all of the claim elements, specifically the narrow particle size distribution. The Examiner has admitted that the Iga patent does not teach the claimed narrow particle size distribution. And the Jaskie patent does not enable the production of narrow particle sizes as claimed by Applicants, as discussed in great detail above. Therefore, the combined disclosures of the Iga patent and the Jaskie patent do not place Applicants' claimed invention in the hands of the public. Since *prima facie* obviousness has not been established and since any showing with respect to particle size distribution has been rebutted by un-refuted evidence in the form of Declarations, the combined disclosures of the Iga patent and the Jaskie patent do not render Applicants' claimed invention obvious.

Applicants respectfully request withdrawal of the rejection of claims 1, 7-9 and 27-30 under 35 U.S.C. §103(a) as being unpatentable over the Iga patent in view of the Jaskie patent.

IV. CONCLUSIONS

Applicants submit that claims 1, 7-9 and 27-30 are patentable over the prior art of record. Applicants believe that the Patent Office has failed to meet their burden of persuasion with respect to unpatentability of any of the claims in view of the total evidence presented. Thus, Applicants respectfully request the reversal of the rejections of claims 1, 7-9 and 27-30 and the allowance of

claims 1, 7-9 and 27-30.

Respectfully submitted,

By: Peter S. Dardi
Peter S. Dardi, Ph.D., Reg. No. 39,650